Year 7 Physics Homework

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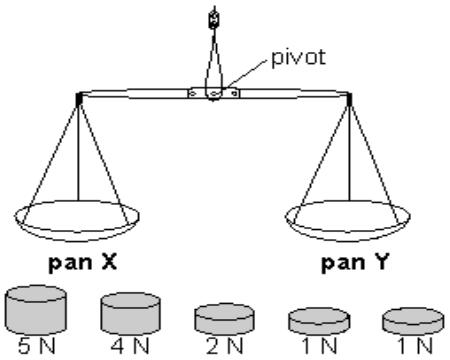
Scientific vocabulary	Definition
air resistance	The force on an object moving through the air that causes it to slow down (also known as drag).
contact force	Force that acts by direct contact, e.g., friction.
compression	Force squashing or pushing together, which changes the shape of an object.
deformation	Changing shape due to a force.
elastic limit	The point beyond which a spring will not return to its original length when the force is removed.
extension	The difference between the original length of an object and the length when you apply a force.
friction	Force opposing motion which is caused by the interaction of surfaces moving over one another. It is called 'drag' if one is a fluid.
gravity/gravitational force	A non-contact force that acts between two masses.
Hooke's Law	A law that says that if you double the force on an object, the extension will double.
interaction pair	When two objects interact there is a force on each one that is the same size but in opposing directions.
linear relationship	When two variables are graphed and show a straight line which goes through the origin, and they can be called proportional.
newton	Unit for measuring forces (N).
newtonmeter	A piece of equipment used to measure weight in newtons.
non-contact force	Force that acts without direct contact, e.g., magnetism.
pull	A type of force.
push	A type of force.

Q1. Ellie has a set of scales and some weights as shown below.



Ellie puts two weights in pan X and one weight in pan Y. The scales balance.

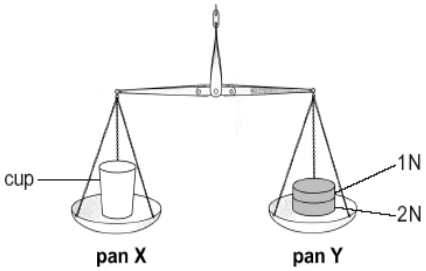
(a) Which weights could be in pans X and Y?

pan X: ..... and .....

pan Y: .....

1 mark

(b) Ellie removes all the weights from the scales. She then puts a cup on pan X. In which direction will pan Y move? ..... 1 mark

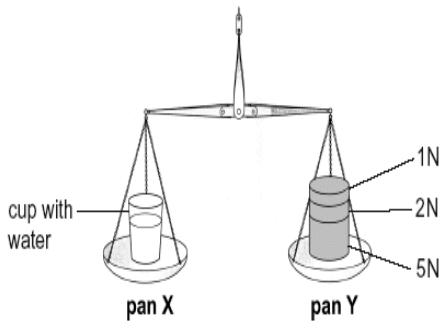


(c) She puts weights into pan Y so the scales balance.

How much does the cup weigh?

..... N. 1 mark

(d) Ellie puts some water in the cup.
She then adds some more weights to pan Y to make the scales balance.



(i) How much do the cup **and** water weigh?

..... N. 1 mark

(ii) How much does the water weigh? ..... N 1 marks

Q2. Sally pulls a sledge in the snow.

(a) (i) Draw an arrow on the rope to show the direction of the force of the rope on the sledge.

Label the arrow **R**.

(ii) Draw an arrow on the diagram to show the direction of the force of gravity on the sledge.

Label the arrow **G**.

2 marks

(b) Force **F** is the friction between the sledge and the snow.
Sally then pulled the sledge over a concrete path.

Friction is less on snow than on concrete.
Give the reason for this.

.....1 mark

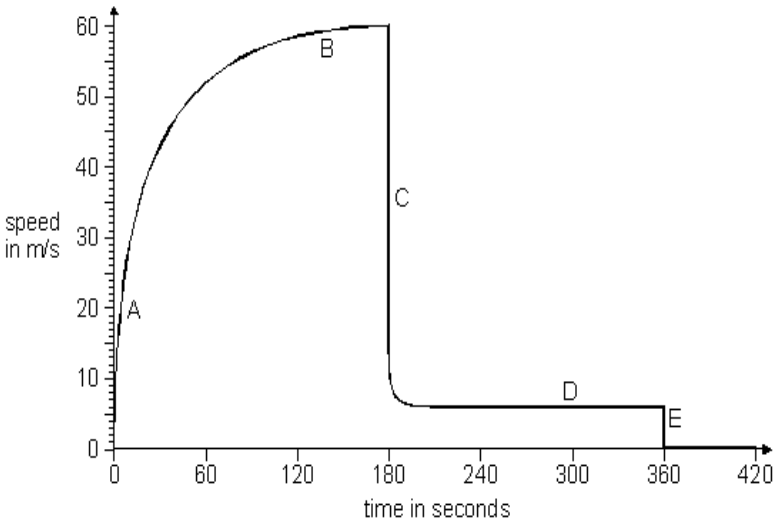
7 FORCES HWK 2

Anagram	Definition	Scientific vocabulary word
r c f l t o l n	Force opposing motion which is caused by the interaction of surfaces moving over one another. It is called 'drag' if one is a fluid.	
ulpu	A type of force.	
e w n n t o	Unit for measuring forces	
a o n t c t c r o c e f	Force that acts by direct contact, e.g., friction.	
y r u i g a t	A non-contact force that acts between two masses.	

New Words

Scientific vocabulary	Definition
lubrication	A substance that reduces friction between surfaces when they rub together.
water resistance	The force on an object moving through water that causes it to slow down, also known as drag.
drag force	The force acting on an object moving through air or water that causes it to slow down.
streamlined	Shaped to reduce resistance to motion from air or water.
reaction	The support force provided by a solid surface like a floor.

Q1. A sky-diver jumped out of an aeroplane. After falling for some time she opened her parachute. The graph below shows how the speed of the sky-diver changed from the moment she jumped out of the aeroplane until she landed on the ground.



(a) What happened at 180 seconds and at 360 seconds after the sky-diver jumped out of the aeroplane?

180 seconds……

360 seconds…… 2 marks

(b) There was an increase in air resistance on the sky-diver as her speed increased. Explain how the graph shows this.

…… 1 mark

(c) Two sections of the graph show where the air resistance was equal and opposite to the sky-diver's weight. Which sections are they? Give the letters.

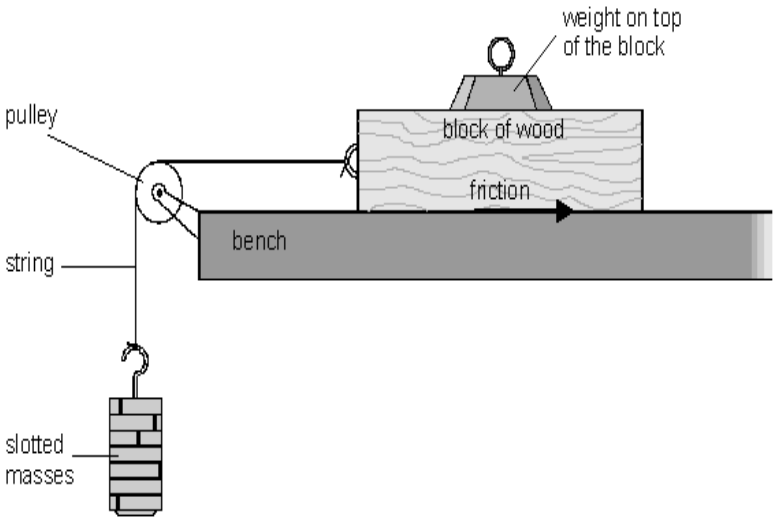
…… and …… 1 mark

(d) (i) Use the graph to estimate how far the sky-diver fell between 180 s and 360 s.

…… 1 mark

(ii) Why can this only be an approximate figure? …… 1 mark

Q2. Nazia is investigating how easily a block of wood slides along a wooden bench. The diagram shows her experiment.



(a) Nazia does the experiment with different weights on top of the block. She counts how many slotted masses she needs to hang from the string to make the block of wood slide. Her results are shown in the table.

weight on top of the block in N	number of slotted masses needed
0	5
1	7
2	9
3	11
4	13

(i) Describe how the number of slotted masses needed to move the block varies with the weight on top of the block.

..... 1 mark

(ii) Nazia does the experiment with a weight of 3.5 N on top of the block of wood. How many slotted masses would she need to make the block slide? ..... 1 mark

(b) Nazia does her experiment again. This time she slides the block of wood over a sheet of glass instead of the bench top.

(i) Suggest how her results would be different this time.

..... 1 mark

(ii) Using the same sheet of glass and block of wood, and keeping the same weight on top, suggest **one** way Nazia could reduce the force of friction. ..... 1 mark

7 FORCES HWK P3

Anagram	Definition	Scientific vocabulary word
a r g d e c r o f	The force acting on an object moving through air or water that causes it to slow down.	
m e t s r a I n l d e	Shaped to reduce resistance to motion from air or water.	
o c e r a l n t	The support force provided by a solid surface like a floor.	
r e t w a a e s s r i t n e c	The force on an object moving through water that causes it to slow down, also known as drag.	
t a l e s c l i i m l t	The point beyond which a spring will not return to its original length when the force is removed.	

New Words

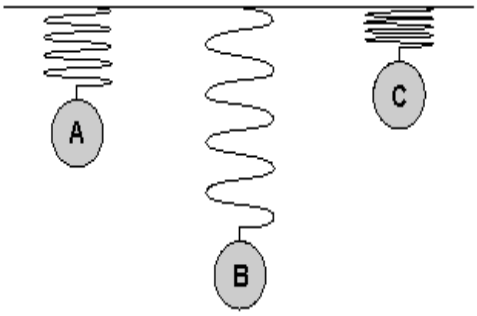
Scientific vocabulary	Definition
balanced (forces)	Forces acting on an object that are the same size but act in opposite directions.
equilibrium	State of an object when all forces are balanced.
unbalanced (forces)	Opposing forces on an object that are unequal.
driving force	The force that is pushing or pulling something.
resistive force	Any force that acts to slow down a moving object.

Q1. (a) John attaches a ball to a spring. The diagram below shows what happens.

(i) Which arrow shows the direction of the **force of the ball on the spring**? Tick the correct box. 1 mark.

(ii) Which arrow shows the direction of the **force of the spring on the ball**? Tick the correct box. 1 mark

(b) The diagram below shows three metal balls attached to **identical** springs. Which ball is the heaviest?
Write the letter. ..... 1 mark

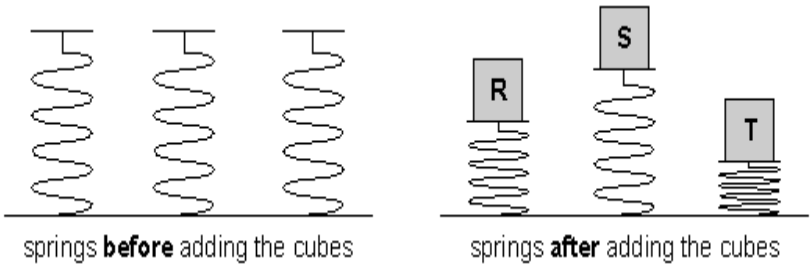


Explain your answer. ..... 1 mark

(c) John has another three **identical** springs.
He puts a cube on each spring. Each cube has a different mass. The diagrams below show the springs before and after John added the cubes.

Which cube is the heaviest?
Write the letter..... 1 mark

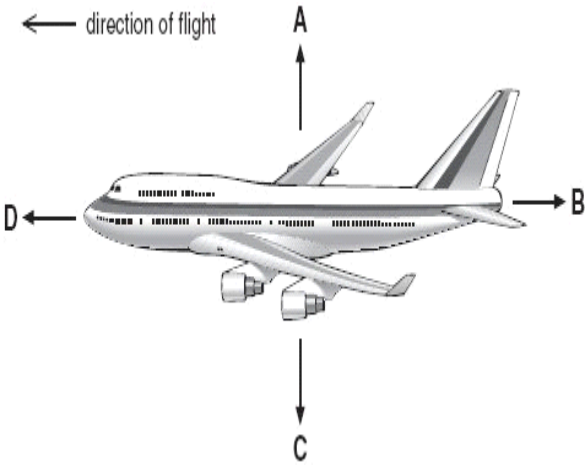
Explain your answer. .....



1 mark

Q2. The diagram shows four forces acting on a plane in flight.

(a) Which arrow represents air resistance?
Give the letter. ..... 1 mark



(b) (i) When the plane is flying at a constant height, which **two** forces must be balanced? Give the letters. ..... and ..... 1 mark

(ii) When the plane is flying at a constant speed in the direction shown, which **two** forces must be balanced?
Give the letters. ..... and ..... 1 mark

(c) (i) Just before take-off, the plane is speeding up along the ground.

Which statement is true? Tick the correct box. 1 mark

Force B is zero. ☐ Force B is greater than force D. ☐

Force D is equal to force B. ☐ Force D is greater than force B. ☐

(ii) Which statement is true about the plane just as it leaves the ground?
Tick the correct box. 1 mark

Force C is zero. ☐ Force C is greater than force A. ☐

Force A is equal to force C. ☐ Force A is greater than force C. ☐ 1 mark

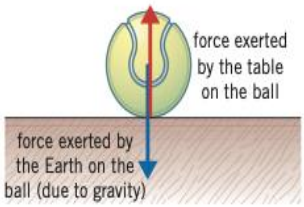
7 FORCES HWK P4

What is a force?

- A **force** can be a **push** or a **pull**
- A force is measured in **Newtons** (N)
- We measure forces with a **newton meter**
- Forces explain why objects will move, change direction and change speed

- Forces always act in pairs, we call these **interaction pairs**

e.g. the tennis ball exerts a downward force of **weight** onto the table, the table exerts an equal and opposite reaction force onto the ball



Types of forces

- **Contact forces** act when two objects are physically touching
- **Air resistance** and **friction** are examples of contact forces

- **Non-contact forces** act when two objects are physically separated (not touching)
- Examples of non-contact forces include **gravitational force** and magnetic forces
- We call the region where an object experiences a non-contact force a **field**, examples of these include gravitational fields and magnetic fields

Balanced and unbalanced forces

- When forces acting on an object are the same size, but acting in different directions, we say that they are **balanced**
- When forces are balanced, the object is either not moving (stationary) or moving at a constant **speed**

- When the two forces acting on an object are not the same size, we say that the forces are **unbalanced**
- When forces are **unbalanced**, the object will either be in **acceleration** or **deceleration**
- The **resultant force** is the difference between the two unbalanced forces

Gravity

- **Gravity** is a non-contact force that acts between two objects
- **Gravitational force** pulls you back to Earth when you jump
- The size of the gravitational force depends on the mass of the two objects and how far apart they are

- **Weight** is the downward force caused by gravity acting upon the mass of an object, it is measured in Newtons (N)
- **Mass** is the amount of matter within an object, whereas weight is the downward force of the object, we measure mass in **kilograms**
- We calculate weight with the equation:

$$\text{weight (N)} = \text{mass (kg)} \times \text{gravitational field strength (N/kg)}$$

- The value of the gravitational field strength can vary, so although a person's mass would be the same on different planets, their weight would not be

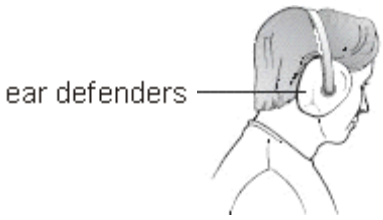
Revise for Forces End of Unit Test

YEAR 7 WAVES HWK P1

Scientific vocabulary	Definition
absorption (absorb(ed))	When energy is transferred from sound (or other waves) to a material.
amplify	To increase the amplitude of a sound so that it sounds louder.
amplitude	The maximum amount of vibration, as measured from the middle position of the wave. Usually measured in metres.
decibel	A commonly used unit of sound intensity or loudness (dB).
infrasound	Sound below a frequency of 20Hz.
kilohertz	1kilohertz (kHz) = 1000 hertz (Hz)
oscilloscope	Device able to view patterns of sound waves that have been turned into electrical signals.
pitch	How high or low a sound is. A low (high) pitch sound has a low (high) frequency.
speed of sound	The distance sound travels in one second (330 m/s).
ultrasound	Sound at a frequency greater than 20 000 Hz, beyond the range of human hearing.
vibration	A back and forth motion that repeats.
volume	How loud or quiet a sound is, in decibels (dB).
wavelength	Distance between two corresponding points on a wave, in metres.

Q1. Three pupils watched a firework display.

(a) A man lit the fireworks. He wore ear defenders.



Why should he wear ear defenders when he is close to loud fireworks?

.....
.

.....
.

1 mark

(b) A rocket exploded making a loud sound and a bright flash.
Peter, Sabrina and Jan were standing at different distances from the rocket.

Jan

Sabrina

Peter

When the rocket exploded, Jan heard the quietest sound.
Why did Jan hear the quietest sound?

.....
.

..... 1 mark

(c) Jan saw the flash before she heard the sound.

What does this tell you about the speed of light and the speed of sound?

.....
.

..... 1 mark

(d) Complete the sentences below using words from the list.

chemical **electrical** **heat** **light** **sound**

(i) Jan, Sabrina and Peter could **see** the rocket explode because it gave out ..... energy.

1 mark

(ii) They could **hear** the rocket explode because it gave out ..... energy. 1 mark

(e) When the rocket stopped burning it fell to the ground.
What force caused it to fall to the ground?

.....

1 mark
maximum 6 marks

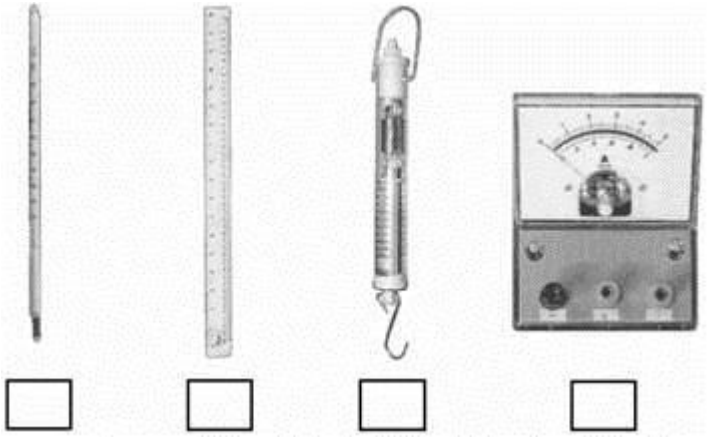
Q2.

Lee blew across the top of paper tubes to make sounds.

He investigated how changing the length of a tube affects the pitch of the sound.

(a) What equipment could he use to measure the length of the tubes?

Tick the correct box.



1 mark

(b) The photograph below shows the different lengths of tubes Lee used.

Suggest **one** way his test might **not** have been fair.

.....

.....

1 mark

(c) Lee made a prediction.

Which of these statements is a prediction?
Tick the correct box.

The tubes were made of paper. ☐

The pitch of the sound is how high or low it is. ☐

The longer tube will make a lower sound. ☐

The sound is caused by the vibration of air. ☐

1 mark

(d) Lee blew across the ends of 3 different lengths of tube and compared the pitch of the sound produced.

His results5 are shown below.

Length of the tube, in cm	*pitch of the sound*
5	*high*
25	*medium*
50	*low*

Which length of tube made the sound with the highest pitch?

..... cm

1 mark
Maximum 4 marks

7WAVES HWK P2

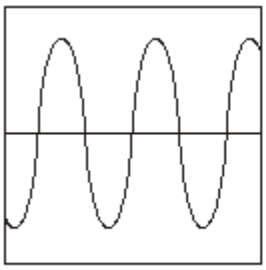
Anagram	Definition	Scientific vocabulary word
amy flip	**To increase the amplitude of a sound so that it sounds louder.**	
adorn funis	**Sound below a frequency of 20Hz.**	
collies scoop	**Device able to view patterns of sound waves that have been turned into electrical signals.**	
and torulus	**Sound at a frequency greater than 20 000 Hz, beyond the range of human hearing.**	
alt hewn veg	**Distance between two corresponding points on a wave, in metres.**	

New Words

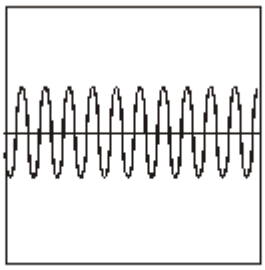
Scientific vocabulary	Definition
auditory canal	The passage in the ear from the outer ear to the eardrum.
auditory nerve	An electrical signal travels along the auditory nerve to the brain.
auditory range	The lowest and highest frequencies that a type of animal can hear.
brain	The organ in the human body that co-ordinates nervous responses.
cochlea	Snail shaped tube in the inner ear with the sensory cells that detect sound.
ear	The organ of the body that detects sound.
eardrum	A membrane that transmits sound vibrations from the outer ear to the middle ear.
inner ear	The semi-circular canals that help you to balance, and your cochlea.
middle ear	The ossicles (small bones) that transfer vibrations from the outer ear to the middle ear.
optic nerve	A paired sensory nerve that runs from each eye to the brain.
ossicle	The small bones of the inner ear (hammer, anvil, and stirrup) that transfer vibrations from the eardrum to the oval window.
outer ear	The pinna, auditory canal, and eardrum.
oval window	The membrane that connects the ossicles to the cochlea.
pinna	The outside part of the ear that we can see.

Q1.

(a) The diagrams below show the patterns produced on an oscilloscope by three
different sound waves.



A



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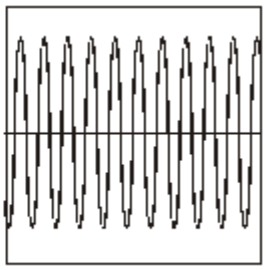


C

(i) Which **two** waves have the same loudness?
Write the letters.

..... and .....

How do the diagrams show this?

.....
.

..... 1 mark

(ii) Which **two** waves have the same pitch?
Write the letters.

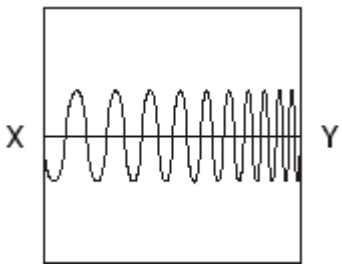
..... and .....

How do the diagrams show this?

.....
.

..... 1 mark

(iii) Shuli is listening to a sound that produces the pattern below.



Describe how the sound that Shuli **hears** changes between X and Y.

..... 1 mark

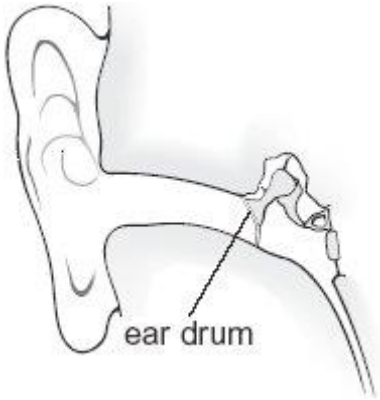
(b) The table below shows the maximum time a person can listen to music at different sound levels without damage to the ear.

sound level (decibels)	maximum time (hours)
86	8
88	4
90	2
92	1
94	0.5

Estimate the maximum time a person could listen to a sound of 87 decibels.

..... hours 1 mark

(c) The diagram below shows part of the human ear.

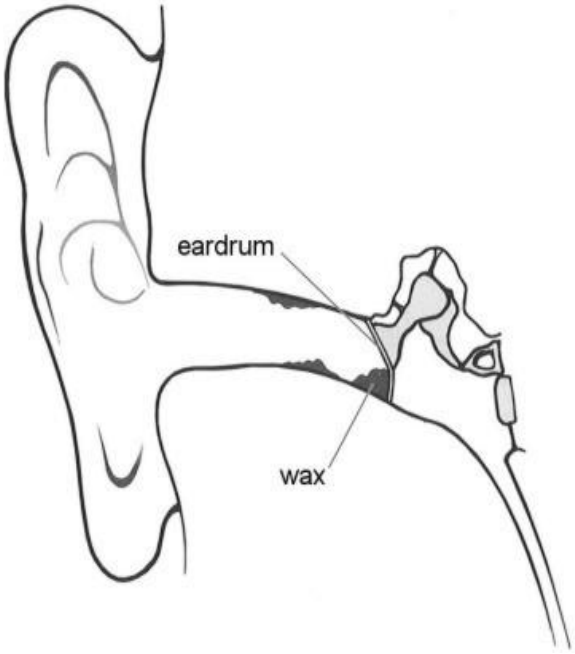


What happens to the ear drum as a sound gets louder?

.....
.

..... 1 mark
maximum 5 marks

Q2. The diagram below shows part of the human ear.



We can hear somebody speaking because sound waves enter our ears.

(a)(i) What do our eardrums do when sound waves

…….. 1 mark

(ii) Sometimes a lot of wax is produced in the ear.
The wax rests against the eardrum, as shown above.

Give **one** reason why we **cannot** hear very well when our ears
contain a lot of wax.

.....

..... 1 mark

(b) The table below shows the lowest and highest frequencies that five living things can hear.

living thing	**lowest frequency (Hz)**	**highest frequency (Hz)**
human	20	20 000
sparrow	300	20 000
dog	20	45 000
cat	20	64 000
rabbit	300	42 000

(i) Which **three** living things from the table **cannot** hear a frequency of 43 000 Hz?

..... and ..... and ..... 1 mark

(ii) From the table, choose the living thing that can hear the biggest **range** of frequencies.

..... 1 mark
maximum 4 marks

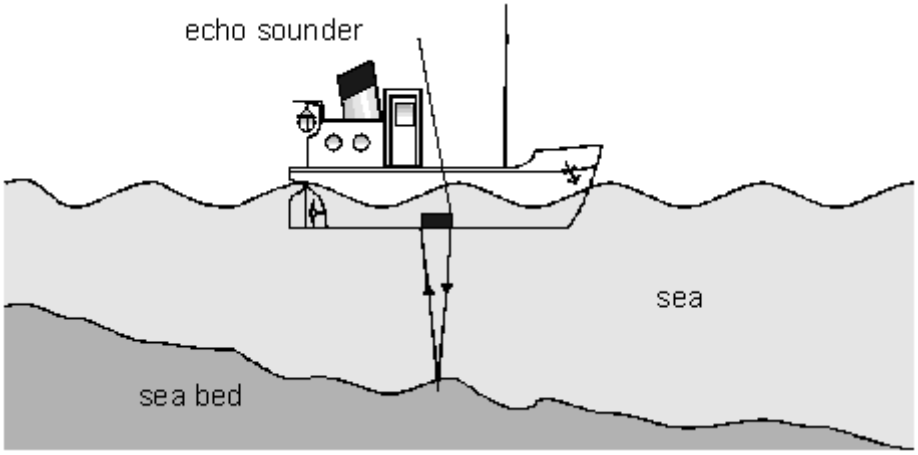
Anagrams	**Definition**	**Scientific vocabulary word**
auditory canal	The passage in the ear from the outer ear to the eardrum.	
auditory nerve	An electrical signal travels along the auditory nerve to the brain.	
auditory range	The lowest and highest frequencies that a type of animal can hear.	
cochlea	Snail shaped tube in the inner ear with the sensory cells that detect sound.	
eardrum	A membrane that transmits sound vibrations from the outer ear to the middle ear.	
optic nerve	A paired sensory nerve that runs from each eye to the brain.	
ossicle	The small bones of the inner ear (hammer, anvil, and stirrup) that transfer vibrations from the eardrum to the oval window.	

New Words

Scientific vocabulary	**Definition**
echo	Reflection of sound waves from a surface back to the listener.
peak	The top of a wave.
reflect (ion)	The change in direction of light or sound when it hits a boundary and bounces back.
speed of sound	The distance sound travels in one second (330 m/s).
trough	The bottom of a wave.
wavelength	Distance between two corresponding points on a wave, in metres.

Q1.

The diagram shows a boat using an echo sounder. It sends a pulse of sound waves which is reflected from the sea bottom. The reflected sound waves are detected by a sensitive microphone.



The time between sending and receiving the pulse is 0.005 s. The device calculates the depth of the sea, using the speed of sound in sea water, which is 1500 m/s.

(a) Calculate the depth of the sea. Show your working.

.....

.....

.....

2 marks

(b) The boat moves into very deep water. Explain why the reflected pulse is too weak to be detected.

.....

.....

1 mark

(c) The boat's 'echo sounder' could **not** be used in an aeroplane to measure its height above the ground unless it had been modified.

Explain why the device will **not** give correct heights above the ground.

.....

.....

1 mark

Maximum 4 marks

Q2.

(a) An early type of echo sounder for a boat produces a sound of frequency 2000 Hz.

(i) The wavelength of this sound in water is 0.75 m. What is the speed of the sound in water? Give the unit.

.....

.....

1 mark

(ii) This sound is heard by the operator as a brief 'ping'. The speed of sound in air is 330 m/s. What is the wavelength of the sound in air? Give the unit.

.....

.....

1 mark

(iii) Modern echo sounders use higher frequencies than the early type. Complete the sentence below to describe how the wavelength produced by a modern echo sounder compares with that produced by the early type.

The wavelength produced by a modern echo sounder is

.....

1 mark

(b) The diagram shows a wave in a 'slinky' spring.

The frequency of the waves is 5 pulses per second and the wavelength is 80 cm.

What is the wave speed? Give the unit.

.....

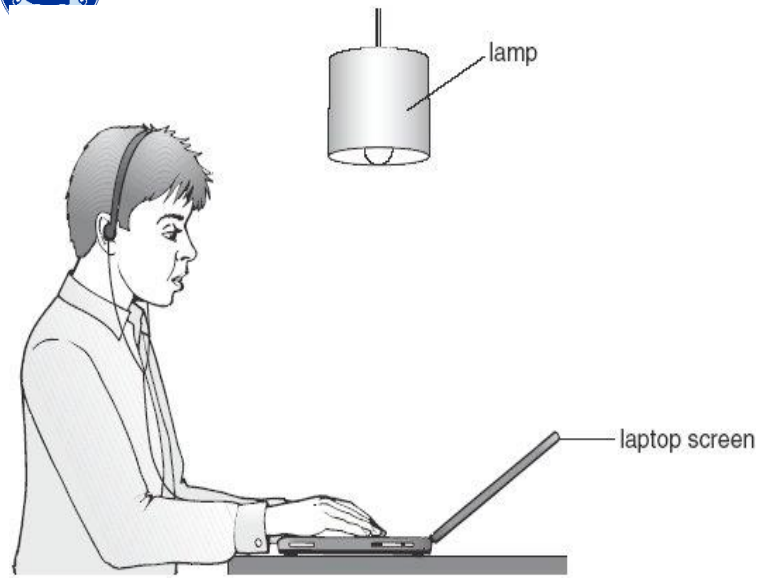
1 mark

Maximum 4 marks

Anagram	Definition	Scientific vocabulary word
co he	Reflection of sound waves from a surface back to the listener.	
ak pe	The top of a wave.	
Clifton ere	The change in direction of light or sound when it hits a boundary and bounces back.	
depose founds	The distance sound travels in one second 330 m/s	
go ruth	The bottom of a wave.	
Galven whet	Distance between two corresponding points on a wave, in metres.	

New Words

Scientific vocabulary	Definition
angle of incidence	Between the normal and incident ray.
angle of reflection	Between the normal and reflected ray.
diffuse reflection	Reflection from a rough surface.
dispersion	The splitting up of a ray of light of mixed wavelengths by refraction into its components.
focal point	The point at which the rays refracted by a convex lens cross over.
image	The point from which rays of light entering the eye appear to have originated.
incident ray	The incoming ray from a source of light.
inverted	Upside down.
iris	The coloured part of your eye.
law of reflection	The angle of incidence is equal to the angle of reflection.
lens	A device made of shaped glass that focusses light rays from objects to form an image.
luminous	Gives out light.
medium	The material that affects light or sound (or other waves) by slowing it down or transferring the wave.
non-luminous	Objects that produce no light.
normal line	An imaginary line from which angles are measured, at right angles to the surface.
opaque	A material that allows no light to pass through it.
optic nerve	A paired sensory nerve that runs from each eye to the brain.
photoreceptor	A specialised cell that is sensitive to light.
plane	A mirror with a flat, reflective surface.
pupil	The hole in the front of your eye where light goes in.
real	An image that you can put on a screen.
reflect (ion)	The change in direction of light or sound when it hits a boundary and bounces back.
reflected ray	The outgoing ray that has been reflected from a surface.
refraction	Change in the direction of light going from one material into another.
retina	Layer at the back of the eye with light detecting cells, where an image is formed.
scattered	When light bounces off an object in all directions.
specular reflection	Reflection from a smooth surface.
translucent	A material that allows some light to pass through it.
transparent	A material that allows all light to pass through it.
virtual	An image that cannot be focussed onto a screen.



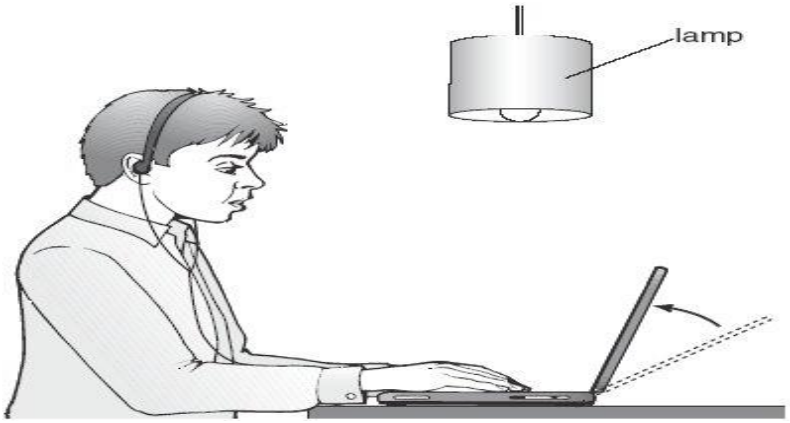
Q1.(a) The diagram below shows George using his laptop.
Light from the lamp is reflected by the laptop screen.

(i) **On the diagram** draw a ray of light to show how George sees the light from the lamp reflected by the laptop screen. Use a ruler.

Draw arrows to show the direction of light.

3 marks

(ii) With the laptop screen in the position shown in part a(i), George sees an image of the lamp on the screen.
George tilts the screen forwards as shown below.



When the screen is tilted forwards it is easier for George to see the words on the screen.
What happens to the reflected ray of light when the screen is tilted?

.....1 mark

(b) George listens to music on his headphones. Complete the sentence below using words from the box.

chemical	**electrical**	**gravitational potential.**
	sound	**thermal**

The useful energy change in the headphones is from .....

energy into ..... energy. 1 mark

maximum 5 marks

Q2. James shone a ray of light at a mirror as shown below.

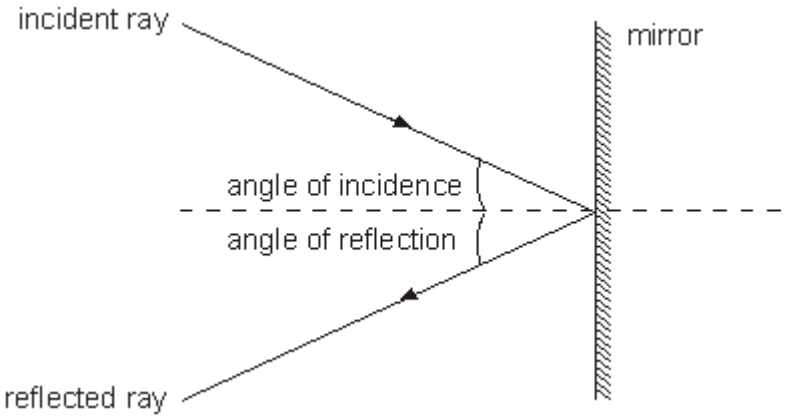


diagram 1

He measured the angle of **reflection** for different angles of incidence.
His results are shown below.

angle of **incidence** (º)	30	40	50	60	70
angle of **reflection** (º)	30	40	50	65	70

(a) Which angle of reflection was **not** measured accurately?

.....°

How can you tell this from the table?

.....

.....

..

1 mark

(b) James set up a different experiment as shown below.

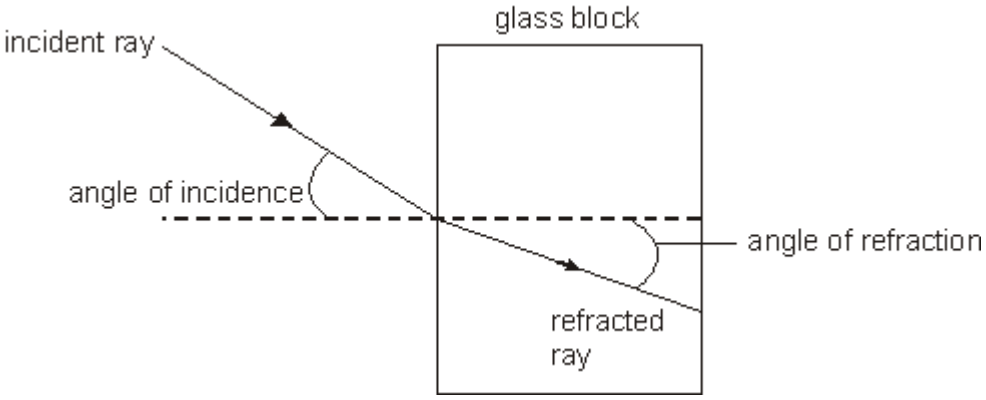
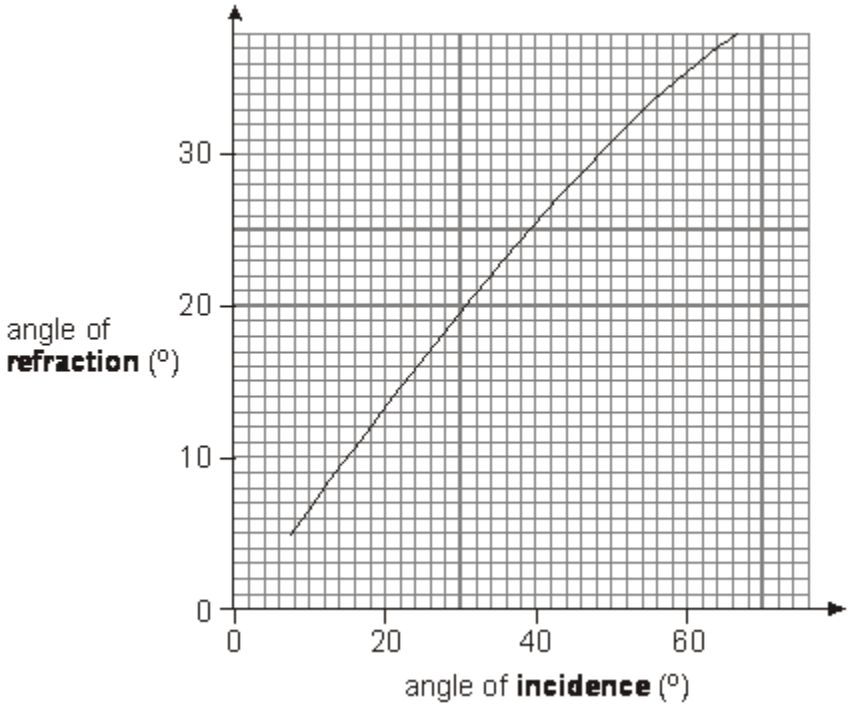


diagram 2

He measured the angle of **refraction** for different angles of incidence.

His results are shown in the graph.



Use the graph to answer the questions below.

(i) When the angle of **refraction** is 20°, what is the angle of **incidence**?

.....°

1 mark

(ii) What conclusion could James draw from his graph?
Complete the sentence below.

When light passes from air into glass, the angle of **incidence** is

always ..... the angle of **refraction**.

1 mark

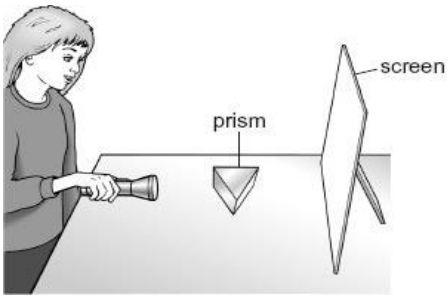
(c) **On diagram 2,** draw a line to continue the refracted ray as it leaves the glass
block.

1 mark
maximum 4 marks

Anagram	Definition	Scientific vocabulary word
confined ligeance	Between the normal and incident ray.	
footfall ingerence	Between the normal and reflected ray.	
Arny identic	The incoming ray from a source of light.	
follow interface	The angle of incidence is equal to the angle of reflection.	
lions umu	Gives out light.	
emu mid	The material that affects light or sound (or other waves) by slowing it down or transferring the wave.	
Imus nol noun	Objects that produce no light.	
Arlin lemon	An imaginary line from which angles are measured, at right angles to the surface.	
poe qua	A material that allows no light to pass through it.	
Hooper protect	A specialised cell that is sensitive to light.	
career deftly	The outgoing ray that has been reflected from a surface.	
Arnie croft	Change in the direction of light going from one material into another.	
Carlen stunt	A material that allows some light to pass through it.	
ants partner	A material that allows all light to pass through it.	

New Words

Scientific vocabulary	Definition
brain	The organ in the human body that co-ordinates nervous responses.
converging	Bringing rays of light together.
convex	A lens that is thicker in the middle and that bends light rays towards each other.
cornea	The transparent layer at the front of the eye that refracts light.
filter	A piece of material that allows some radiation (colours) through but absorbs the rest.
image	The point from which rays of light entering the eye appear to have originated.
iris	The coloured part of your eye.
lens	A device made of shaped glass that focusses light rays from objects to form an image.
optic nerve	A paired sensory nerve that runs from each eye to the brain.
photoreceptor	A specialised cell that is sensitive to light.
primary colour	The colours red, blue, and green.
prism	A triangular-shaped piece of glass used to produce a spectrum of light.
pupil	The hole in the front of your eye where light goes in.
real	An image that you can put on a screen.
retina	Layer at the back of the eye with light detecting cells, where an image is formed.
scattered	When light bounces off an object in all directions.
secondary colour	Colours that can be obtained by mixing two primary colours.
spectrum	A band of light produced when light is spread out by a prism.



Q1.

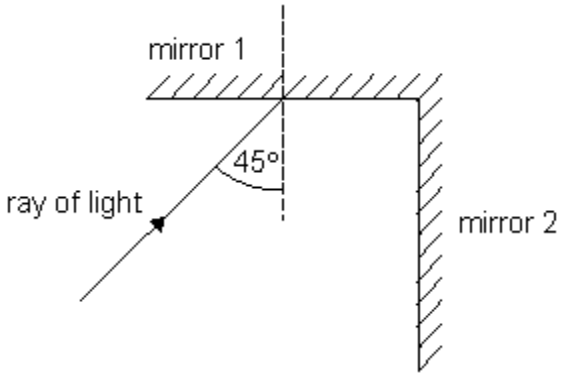
Ann shines a ray of white light at a glass prism.

(a) Tick one box in each row to show if each sentence is **true** or **false**.

	true	**false**
The light refracts as it enters the prism.	☐	☐
The light refracts as it travels through the prism.	☐	☐
The light disperses as it leaves the prism.	☐	☐
The light forms a spectrum of colours on the screen.	☐	☐

2 marks

(b) Ann places two mirrors at 90° and shines a ray of light at mirror 1.



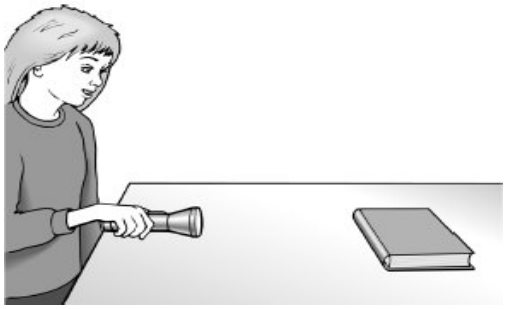
(i) **On the diagram above** continue the ray of light to show how it is reflected by both mirrors. Use a ruler.

2 marks

(ii) **On the diagram above** label the incident ray (i) and the reflected ray (r) for the light striking **mirror 2**.

1 mark

(c) Ann shines the torch at a red book.

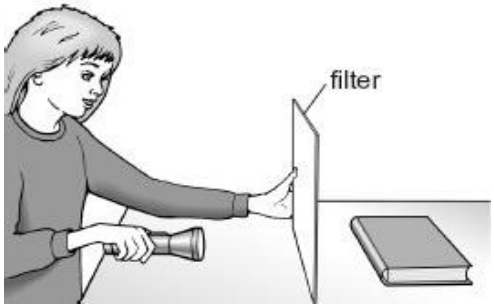


Explain why the object looks red in white light.

……

2 marks

(d) In a dark room, Ann puts different coloured filters in front of the torch.
She records the colour the book appears.



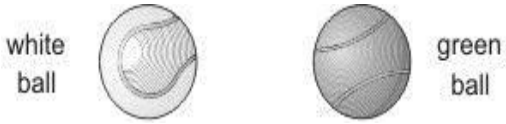
Complete the table below to show the colour that the book would appear.
Tick **one** box in each row. The first one has been done for you.

1 marks

colour of filter	What colour does the red book appear?		
	red	**green**	**black**
no filter	✓		
red filter			
green filter			

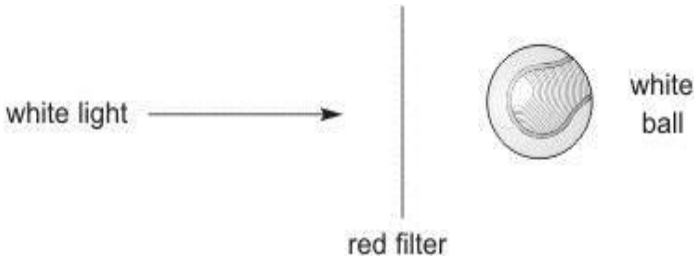
maximum 8 marks

Q2. (a) Peter had two different coloured tennis balls as shown below.



He shone white light through a red filter onto each ball.

(i) **experiment 1**

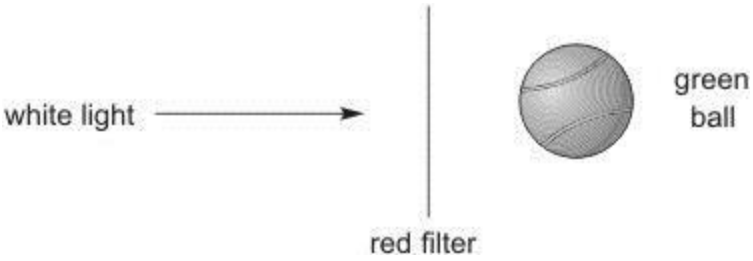


The white ball appeared red.
Explain why this ball appeared red.

.....

..... 2 marks

(ii) **experiment 2**



What colour did this ball appear?

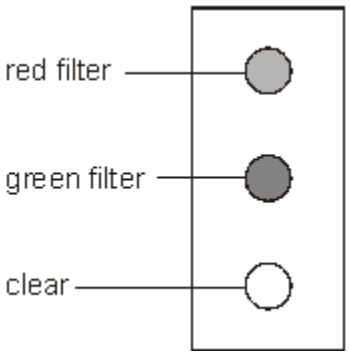
.....

Explain your answer.

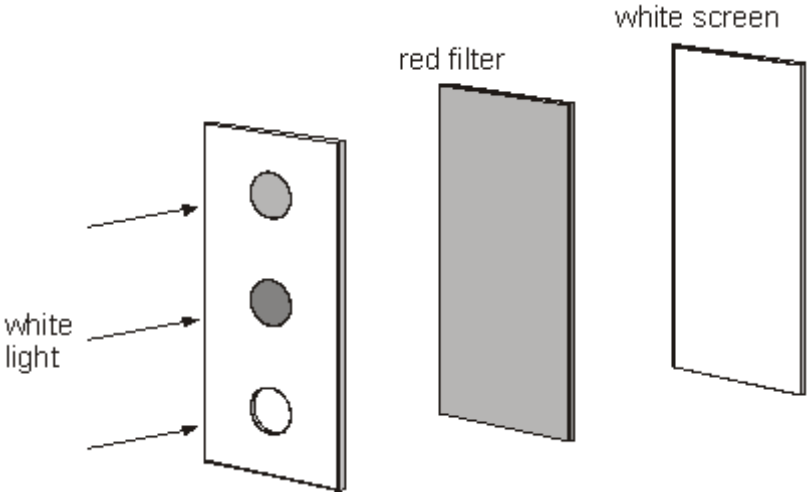
.....

..... 2 marks

(b) Peter set up a different experiment.
He cut three holes in a piece of card.
Two of the holes were covered by coloured filters as shown below.



Peter placed a red filter between the piece of card and a white screen.
He shone white light at the piece of card with three holes



in it.

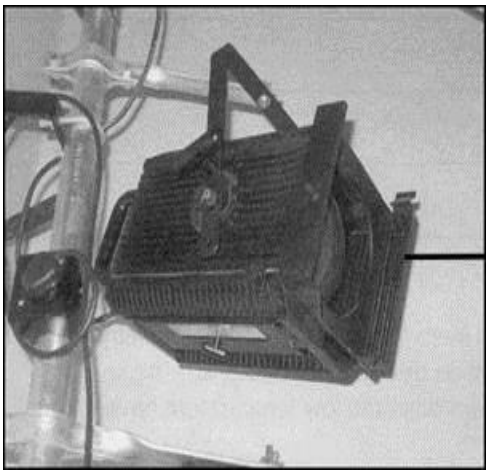
What would Peter see on the screen?

.....
..

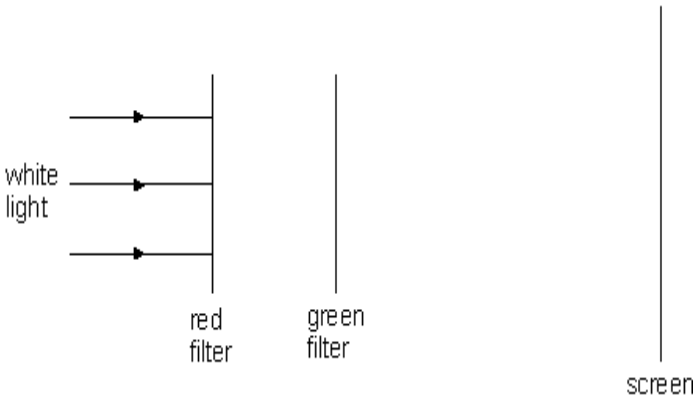
.....1 mark
maximum 5 marks

Q3.

(a) Peter tried to obtain a mixture of red and green light.
He used white light from a spotlight and slotted a red filter and a green filter in front of it as shown below.



The diagram below represents Peter's experiment.



(i) **No** light reached the screen. Explain why.

.....

..... 2 marks

(ii) Peter cut a circular hole in the green filter. Describe what Peter would see on the screen.

.....

..... 1 mark

(b) Peter used two spotlights to shine a mixture of red and green light on to some red curtains.

(i) What colour did the red curtains appear in this light?

..... 1 mark

(ii) Give the reasons why they appeared this colour.

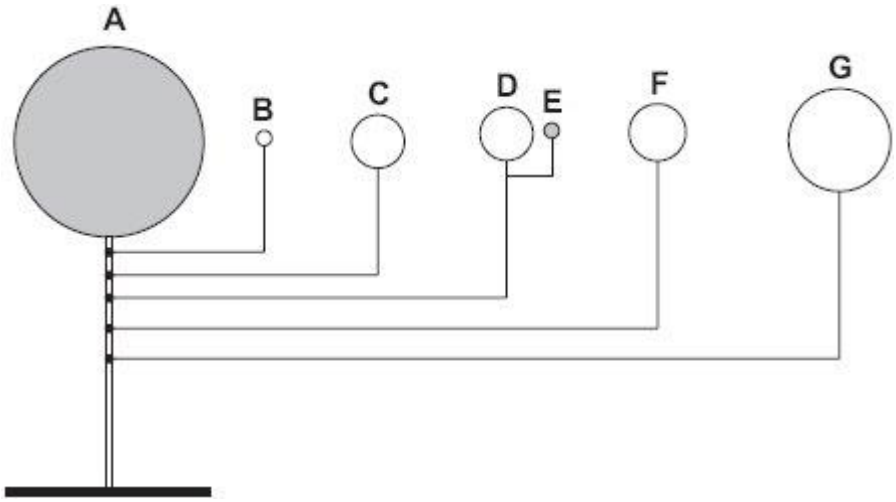
.....

..... 2 marks
Maximum 6 marks

YEAR 7 EARTH AND SPACE HWK P1

Scientific vocabulary	Definition
artificial satellite	A manmade spacecraft.
asteroid	Lumps of rock orbiting the Sun left over from when the Solar System formed.
constellation	A collection of stars that make a pattern in the sky.
dwarf planet	A small lump of rock in orbit around the Sun.
Earth	A rocky inner planet third from the Sun in the Solar System.
exoplanet	Planet that orbits a Sun outside our Solar System.
galaxy	Collection of stars held together by gravity. Our galaxy is called the Milky Way.
geocentric model	A model of the Solar System with the Earth at the centre.
heliocentric model	A model of the Solar System with the Sun at the centre.
light year	The distance light travels in a year (over 9 million, million kilometres).
Milky Way	Galaxy containing our Sun, Solar System, and billions of other stars and planets.
night	The period on one section of the Earth, or other planet, when it is facing away from the Sun.
orbit	Path taken by one object moving around another larger object, such as a satellite around the Earth. Earth completes one orbit of the Sun every year.
planet	Any large body that orbits a star in a Solar System.
season	Changes in temperature during the year as the Earth moves around its orbit.
Solar System	The Sun and the planets and other bodies in orbit around it.
star	Bodies that give out light and that may have a Solar System of planets.
Sun	The star at the centre of our Solar System.
Universe	Everything that exists.

Q1. (a) Alfie made a model of part of the solar system.
He used metal balls for the Sun, the Moon and the planets.



- E goes around D.
- B, C, D, F and G go around A.

Give the letter that is used to label:

(i) the model Sun;

..... 1 mark

(ii) the model Earth;

..... 1 mark

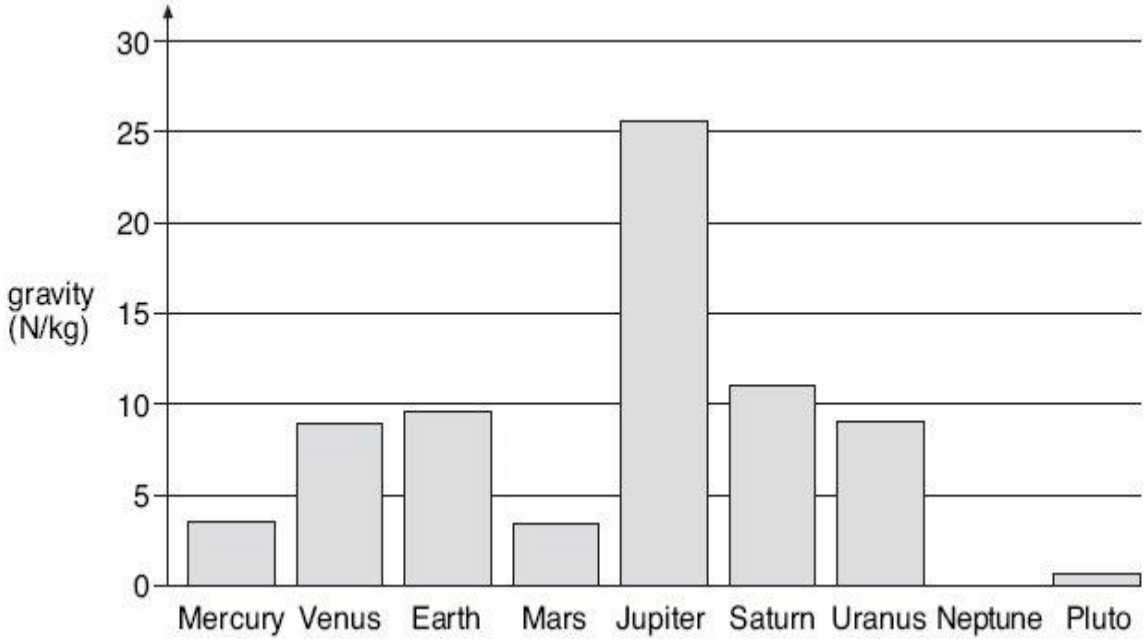
(iii) the model Moon;

..... 1 mark

(iv) the model planet with the largest orbit.

..... 1 mark

(b) The bar chart shows the force of gravity on eight of the planets.



(i) The gravity on Neptune is 12 N/kg.

On the chart above, draw a bar for the planet Neptune.
Use a ruler.

1 mark

(ii) Give the name of a planet where you would weigh more than you weigh on
Earth.

.....

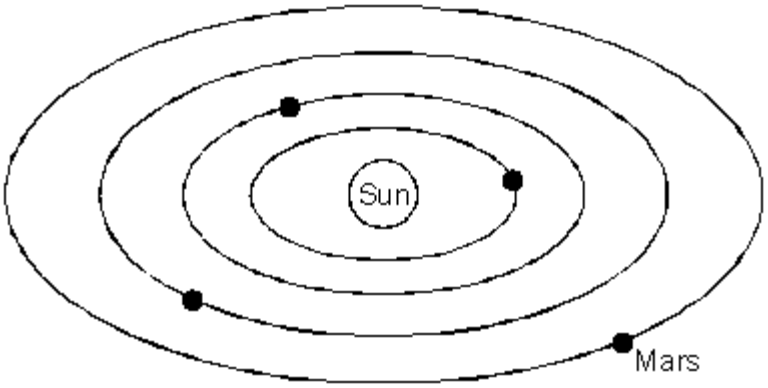
1 mark

(iii) On which planet would a spaceship need the largest force to take off?

.....

1 mark
maximum 7 marks

Q2. Mars is the fourth planet from the Sun.



not to scale

(a) Name **one** planet which is closer than Mars to the Sun.

.....

1 mark

(b) A day and night on Mars lasts nearly 25 Earth hours. Explain why there is daytime and night-time on Mars.

.....

.....

1 mark

(c) Like Earth, Mars has summers and winters.
Suggest why there are seasons on Mars.

.....

.....

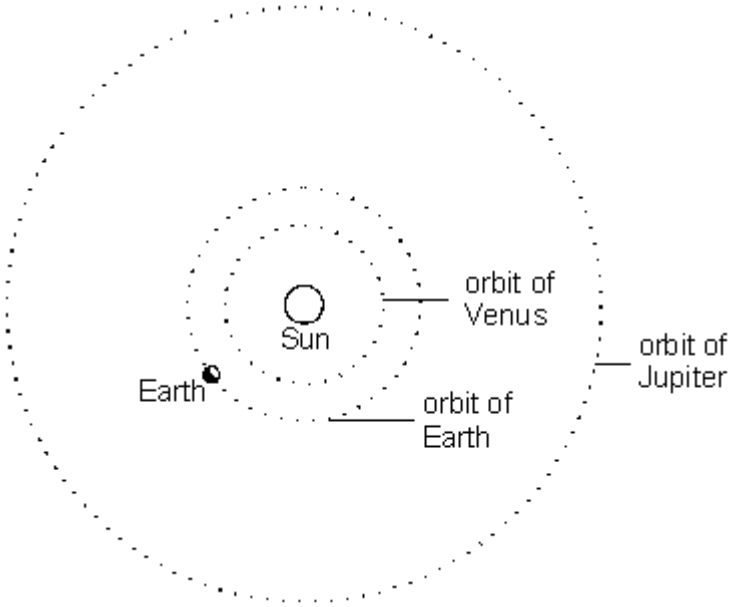
1 mark
Maximum 3 marks

Anagram	Definition	Scientific vocabulary word
Aelfric elitist Talia	A manmade spacecraft.	
anoints collet	A collection of stars that make a pattern in the sky.	
flat predawn	A small lump of rock in orbit around the Sun.	
a ga LyX	Collection of stars held together by gravity. Our galaxy is called the Milky Way.	
clod merogenetic	A model of the Solar System with the Earth at the centre.	
chilled iconometer	A model of the Solar System with the Sun at the centre.	
alight rye	The distance light travels in a year (over 9 million, million kilometres).	
AI my wkly	Galaxy containing our Sun, Solar System, and billions of other stars and planets.	
alms storeys	The Sun and the planets and other bodies in orbit around it.	
Eur veins	Everything that exists.	

New Words

Scientific vocabulary	Definition
axis	The imaginary line that the Earth spins around.
constellation	A collection of stars that make a pattern in the sky.
day	The time it takes a planet to make one full spin on its axis.
Moon	A rocky body orbiting the Earth, it is Earth's only natural satellite.
natural satellite	A moon in orbit around a planet.
phases of the Moon	Shape of the Moon as we see it from Earth because it reflects light from the Sun.
year	The length of time it takes for a planet to orbit the Sun.

Q1. The diagram shows the orbits of the Earth, Venus and Jupiter around the Sun. They are not to scale.



(a) Where is the orbit of Mars?

Tick the correct box.

It is between the Sun and the orbit of Venus. ☐

It is between the orbit of Venus and the orbit of Earth. ☐

It is between the orbit of Earth and the orbit of Jupiter. ☐

It is outside the orbit of Jupiter. ☐

1 mark

Venus and Jupiter can be seen from the Earth.

(b) Sometimes Venus appears to be larger than at other times.

(i) On the diagram, draw the position of Venus where it appears to be largest.
Label it **V**.

1 mark

(ii) Why does the size of Venus appear to change?

.....

..... 1 mark

(c) Even on clear nights, Jupiter sometimes appears to be slightly brighter than at other times.

(i) On the diagram, draw the position of Jupiter where it appears to be brightest.
Label it **J**. 1 mark

(ii) Why does the brightness of Jupiter appear to change?

.....

..... 1 mark

(d) Give **two** reasons why less light is reflected from Jupiter to the Earth than from Venus to the Earth.

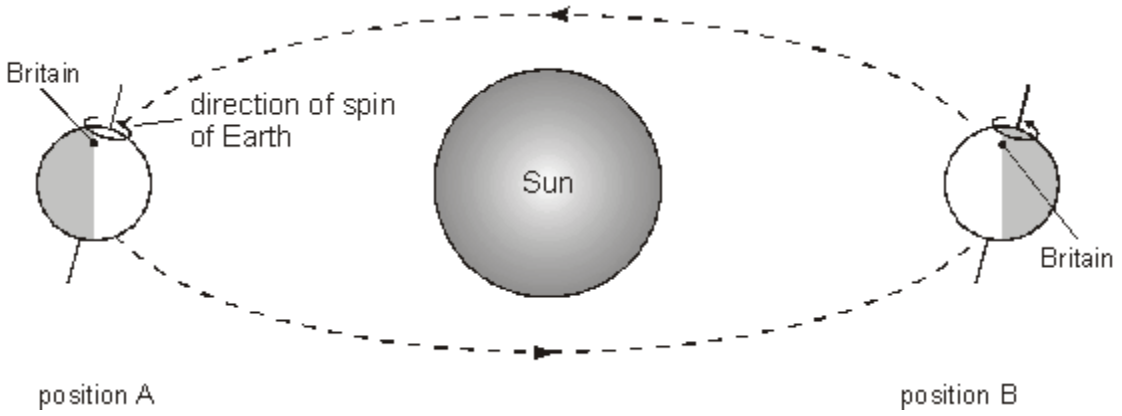
1. .....

2. ..... 2 marks

Maximum 7 marks

Q2.

The diagram shows the Earth's orbit. The Earth is shown in two positions six months apart. In one of the positions it is midsummer in Britain, and in the other positions it is midwinter.



(a) Estimate what time of the day it is in Britain when the Earth is in position B, and explain your answer.

.....

..... 1 mark

(b) The Earth has rotated **exactly** 183 times on its axis as it moved between the two positions shown.

(i) Explain how you can tell from the diagram that the Earth has rotated a whole number of times.

.....

..... 1 mark

(ii) Explain how you can tell from the diagram that the time of day in Britain is different in the two positions.

.....

..... 1 mark

(iii) While the Earth has rotated exactly 183 times, only 182.5 days have passed. Calculate the exact time taken for each rotation of the Earth on its axis.

.....

..... 1 mark

(c) The Moon orbits the Earth approximately once each month. However, only one face of the Moon is ever visible from the Earth.

(i) Explain why we always see the same face of the Moon.

.....

..... 1 mark

(ii) Suggest how long in Earth days the period from sunrise to sunrise will be at a point on the Moon's surface.

.....

1 mark

Maximum 6 marks

7 EARTH AND SPACE HWK P3

Anagram	Definition	Scientific vocabulary word
a six	The imaginary line that the Earth spins around.	
Callisto tenon	A collection of stars that make a pattern in the sky.	
a yd	The time it takes a planet to make one full spin on its axis.	
noom	A rocky body orbiting the Earth, it is Earth's only natural satellite.	
estrual tetanilla	A moon in orbit around a planet.	
Afton home poshes	Shape of the Moon as we see it from Earth because it reflects light from the Sun.	
a rye	The length of time it takes for a planet to orbit the Sun.	

Q1. Satellites can sometimes be seen in the night sky. They look like stars slowly moving across the sky.

(a) We can see stars because they are light sources. They give out their own light. Satellites do not give out their own light. Explain why satellites can be seen in the clear night sky.

.....

.....

..... 2 marks

(b) Sometimes a satellite suddenly stops being visible. However, you can usually see it again in another part of the sky later the same night. This can happen when there are no clouds in the sky and the satellite is overhead.

Why does the satellite suddenly stop being visible?

.....

..... 1 mark

(c) Give one use of satellites in orbit around the Earth.

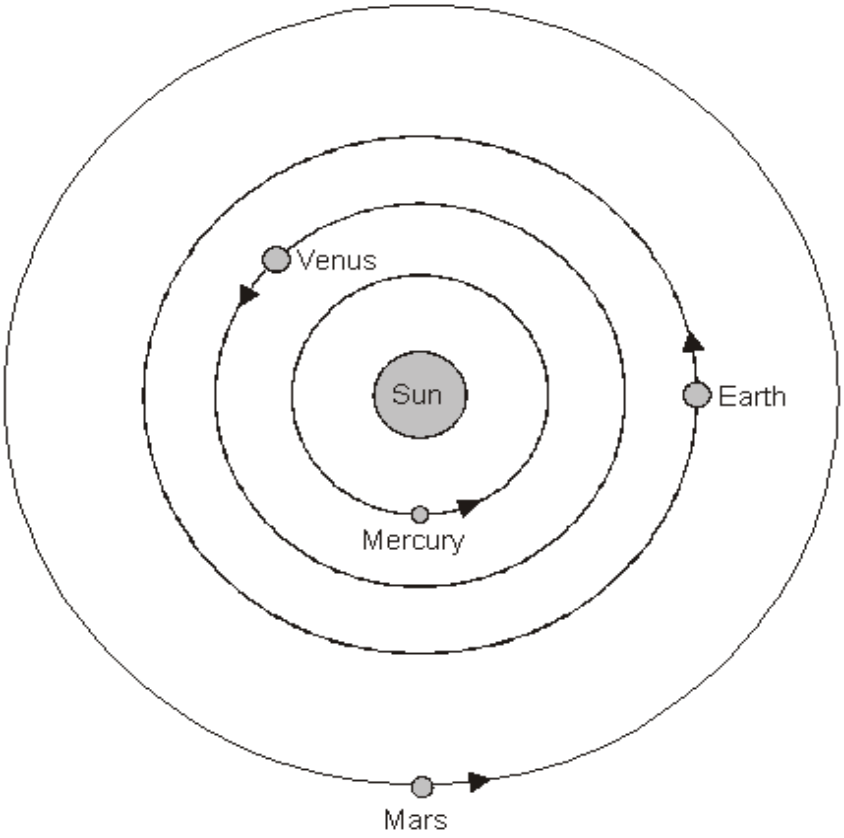
.....

..... 1 mark

Maximum 4 marks

Q2. The table below shows information about four planets.

planet	time taken to orbit the Sun (Earth years)	distance from the Sun (million km)
Mercury	0.25	60
Venus	0.5	108
Earth	1.0	150
Mars	2.0	228



The diagram below shows the orbits of the Earth, Mercury, Venus and Mars, and their position at one particular time. The arrows show the direction in which the planets move.

not to scale

(a) Show the position of each planet six months later by drawing a letter X on the orbit of each planet.
2 marks

(b) Use the information in the table to calculate the largest and smallest distance between the Earth and Venus.

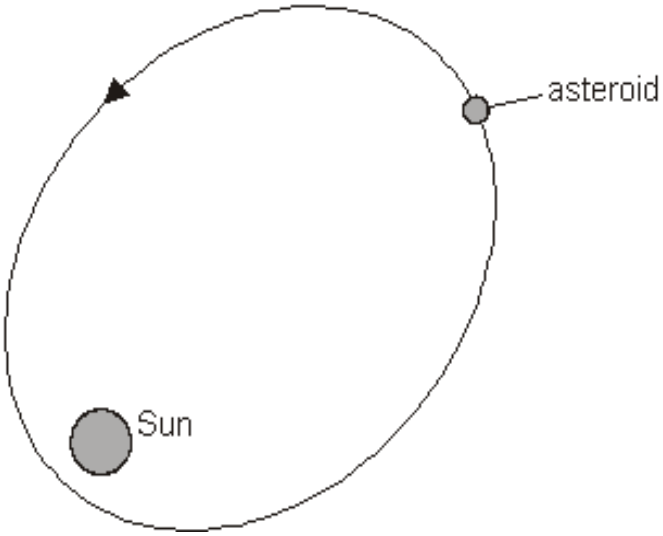
closest ..... million km 1 mark

furthest ..... million km 1 mark

(c) The speed of light is 300 000 km/second.
Calculate how long light takes to reach the Earth from the Sun..

..... s 1 mark

(d) The diagram below shows the path of an asteroid around the Sun.



not to scale

(i) **On the path of the asteroid**, draw a letter S to show the position where the asteroid is travelling the slowest.

On the path of the asteroid, draw a letter F to show the position where the asteroid is travelling the fastest.

1 mark

(ii) Explain why the speed of the asteroid changes.

.....

.

..... 1 mark

maximum 7 marks

Q3. (a) Water waves are transverse waves. Sound waves are longitudinal waves.

(i) Explain the difference between a transverse wave and a longitudinal wave.

You may include labelled diagrams in your answer.

.....

.....

.....

.....

.....

.....

..... **(3)**

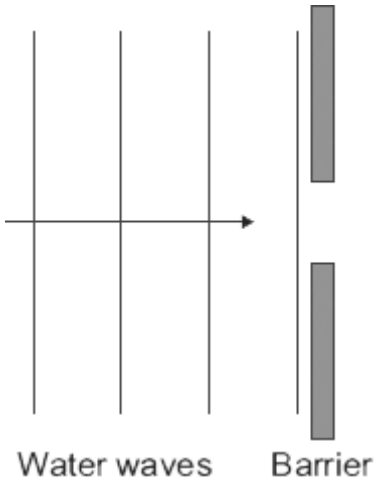
(ii) Name **one** type of wave that may be either transverse or longitudinal.

..... **(1)**

(b) The diagram shows water waves in a ripple tank moving towards a gap in a barrier.

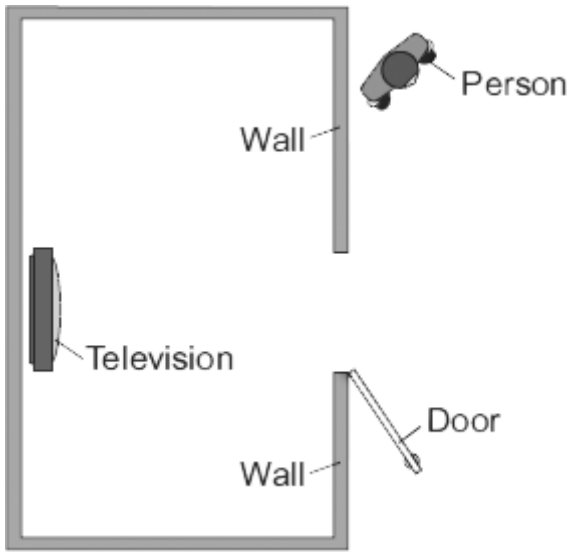
The water waves diffract as they pass through the gap.

Complete the diagram to show the diffracted water waves.



(1)

(c) A television is switched on inside a room. A person outside the room can hear the television, but only when the door is open.



When the door is open, the person can hear the sound but cannot see the television.

Explain why.

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.....**(2). (Total 7 marks)**